FIGURE

ADAPTIVE FILTER TO REDUCE MULTIPATH

4 Aircraft

Direct Path

2

5

1 Tx

3 Building

3 Water Tower

6 Rx

SIGNAL

7

Analog to Digital

Real to Complex

8

9

10

11

D

D

D

12 w_1

w_2

w_3

D = Delay one Sample

−

"Whiten" Spectrum (Decorrelate)

13

RESIDUAL

17

SIGNAL

11

D

D

D

−

11

+

18 w_1

w_2

w_3

14

D

D

D

15 x_{11}

x_{12}

x_{13}

Restore Spectrum

16 E

E

E

$E = e^{j2\pi ft}$

j = unit imaginary number

f = frequency increment

t = time

15 x_{21}

x_{22}

x_{23}

16 E

E

E

Minimize Mean Square
RESIDUAL over:

15 x_{31}

x_{32}

x_{33}

$w_1 , w_2 , w_3 , \dots , x_{11} , x_{12} , x_{13} , \dots ,$

$x_{21} , x_{22} , x_{23} , \dots , x_{31} , x_{32} , x_{33} , \dots$

Multipath Canceller

3